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10/664,566

09/17/2003

James W. Iseli

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EXAMINER

HUGHES, SCOTT A

ART UNIT

PAPER NUMBER

3663

DATE MAILED: 09/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/664,566

Applicant(s)

ISELI, JAMES W.

Examiner

Scott A. Hughes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <sup>3</sup>~~4~~ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26, 61-63 and 69-71 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26, 61-63 and 69-71 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/16/2004, 1/26/04.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

Applicant's election of Group I, claims 1-26, 61-63 and 69-71 without traverse is confirmed.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-13, 15-26, 61, and 63 are rejected under 35 U.S.C. 102(e) as being anticipated by Tanenhaus.

With regard to claim 1, Tanenhaus discloses an apparatus for seismic data acquisition (Column 4, Lines 10-31). Tanenhaus discloses a sensor unit for sensing seismic energy, the sensor unit providing a signal indicative of seismic energy sensed by the sensor unit (Column 2; Column 4, Lines 10-45; Columns 5-6). Tanenhaus discloses an acquisition device co-located with the sensor unit and coupled thereto for receiving the signal (Figs. 1, 8-9) (abstract; Column 2; Column 5, Line 10 to Column 6). Tanenhaus discloses a memory unit having a first memory disposed in the acquisition device for storing in digital form information indicative of the received signal (Column 6, Lines 1-8; Column 6, Lines 55-65; Column 9). Tanenhaus discloses a second memory

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for storing a location parameter associated with the sensor unit (Column 8, Lines 50-60). Tanenhaus discloses a communication device for providing direct bi-directional communication between the acquisition device and a remotely located central controller (abstract; Column 7; Column 8, Lines 1-10, 26-43; Column 9) (Fig. 1, Fig. 9).

With regard to claim 2, Tanenhaus discloses that the sensor unit and the acquisition device are housed in a common housing (Fig. 9).

With regard to claim 3, Tanenhaus discloses that the sensor unit and the acquisition device are coupled together with a cable (Columns 4-6) (Figs. 1,9). The MEMS accelerometer sensors and other sensors (including other seismic sensors as disclosed) are connected to the rest of the circuitry in the device with wires. This is read as being connected by a cable since they are electrically connected to the rest of the acquisition device by conductors that allow the signals to be passed from one part of the device to another.

With regard to claim 4, Tanenhaus discloses that the sensor unit includes a velocity sensor (Column 4, Lines 10-45).

With regard to claim 5, Tanenhaus discloses that the sensor includes an accelerometer (Column 4, Lines 10-45).

With regard to claim 6, Tanenhaus discloses that the sensor unit includes a multi-component sensor (Column 4, Lines 10-45).

With regard to claim 7, Tanenhaus discloses that the sensor unit has a multi-component accelerometer having a digital output signal (Column 4, Lines 10-45; Column 5).

With regard to claim 8, Tanenhaus discloses an analog to digital converter disposed in the sensor unit, the signal provided by the sensor unit including a digital signal (Column 2; Column 5).

With regard to claim 9, Tanenhaus discloses that the signal is an analog signal, the apparatus further comprising an analog-to-digital converter disposed in the acquisition device for converting the signal to digital data (Column 2, Column 5).

With regard to claim 10, Tanenhaus discloses that the first memory is a nonvolatile memory (Column 6, Lines 55-65).

With regard to claim 11, Tanenhaus discloses that the first memory comprises a removable memory (Column 6, Lines 55-65). Flash memory is known to be removable.

With regard to claim 12, Tanenhaus discloses that the first memory comprises a nonvolatile removable memory card (Column 5, Lines 55-65).

With regard to claim 13, Tanenhaus discloses that the memory unit includes an inductive coupling device for transferring the information stored in the memory unit to an external device (Column 7; Column 8, Lines 1-10, 25-60).

With regard to claim 15, Tanenhaus discloses that the sensor unit is coupled to the acquisition device using a sensor connector, the memory unit also being coupled to the sensor connector for enabling retrieval of the information stored in the memory unit using the sensor connector (Figs. 1, 6-9). All of the components are connected together by circuitry that is read as being a sensor connector. The sensors, processors, and memory are all connected together inside of the acquisition device.

With regard to claim 16, Tanenhaus discloses that communication with the central controller provides wireless command and control for the apparatus (Column 2; Column 7; Column 8, Lines 1-10, 25-60; Column 9).

With regard to claim 17, Tanenhaus discloses a processor associated with the acquisition unit and the communication device, the processor processing programmed instructions enabling a software defined radio transceiver (Column 2; Column 7; Column 8, Lines 1-10, 25-60; Column 9).

With regard to claim 18, Tanenhaus discloses that the communication device includes a direct conversion radio transceiver for wireless communication between the apparatus and the remotely located central controller (Column 2; Column 7; Column 8, Lines 1-10, 25-60; Column 9).

With regard to claim 19, Tanenhaus discloses a processor in the acquisition unit for providing one or more of local control, time keeping, or power management (Column 7; Column 6, Line 65 to Column 7, Line 12).

With regard to claim 20, Tanenhaus discloses a power source disposed in the acquisition device for providing electrical power to one or more of the acquisition device, the sensor unit, and the communication device (Column 7).

With regard to claim 21, Tanenhaus discloses that the power source is removable (Column 7, Lines 29-63).

With regard to claim 22, Tanenhaus discloses that the power source is a rechargeable battery (Column 7, Lines 29-63).

With regard to claim 23, Tanenhaus discloses an inductive coupling in the acquisition device, the inductive coupling being operably coupled to the rechargeable battery to allow charging of the rechargeable battery by a second power source external to the acquisition device (Column 7, Lines 29-63).

With regard to claim 24, Tanenhaus discloses a connector disposed in the data acquisition device, the connector being operably coupled to the rechargeable battery to allow charging of the battery by the external power device (Column 7, Lines 29-63).

With regard to claim 25, Tanenhaus discloses that the rechargeable battery is a lithium based battery (Column 7, Lines 29-63).

With regard to claim 26, Tanenhaus discloses a GPS receiver associated with the sensor unit for determining the location parameter (Column 8, Lines 50-60).

With regard to claim 61, Tanenhaus discloses a system for seismic surveying. Tanenhaus discloses a central controller 50 (Fig. 1), a sensor unit 20 remotely located from the central controller, the sensor unit coupled to the earth for sensing seismic energy in the earth and for providing a signal indicative of the sensed seismic energy (Column 2; Column 4, Lines 10-45; Columns 5-6). Tanenhaus discloses a recorder device co-located with the sensor unit and coupled thereto for receiving the signal and for storing in digital form information indicative of the received signal in a first memory disposed in the recorder device (Figs. 1, 6-9) (Column 2; Column 4, Lines 10-65; Column 5; Column 6, Lines 42-65; Column 9). Tanenhaus discloses a second memory for storing a location parameter associated with the sensor unit (Column 8, Lines 50-60), and a communication device co-located with the sensor unit and the recorded

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device for providing bi-directional communication with the central controller (Column 2; Column 7; Column 8, Lines 1-10, 25-60; Column 9).

With regard to claim 63, Tanenhaus discloses that the communication device includes a two-way wireless transceiver for wireless communication with the central controller (Columns 7-8).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 8-9, 13-19, 26, 61-63, and 69-71 are rejected under 35 U.S.C. 102(b) as being anticipated by Rialan (5276655).

With regard to claim 1, Rialan discloses an apparatus for seismic data acquisition (abstract). Rialan discloses a sensor unit R for sensing seismic energy, the sensor unit providing a signal indicative of seismic energy sensed by the sensor unit (Column 4, Lines 20-30). Rialan discloses an acquisition B device co-located with the sensor unit and coupled thereto for receiving the signal (Column 4, Line 25). Rialan discloses a memory unit having a first memory disposed in the acquisition device for storing in digital form information indicative of the received signal (Column 5, Lines 30-55). Rialan discloses a second memory for storing a location parameter associated with the sensor unit (Column 4, Lines 47-60; Column 5, Lines 40-55). Rialan discloses a communication device for providing direct bi-directional communication between the



acquisition device and a remotely located central controller 1 (Column 4, Lines 10-45; Column 5).

With regard to claim 3, Rialan discloses that the sensor unit and the acquisition device are coupled together with a cable (Column 4, Lines 20-30) (Fig. 1).

With regard to claim 8, Rialan discloses an analog to digital converter disposed in the sensor unit, the signal provided by the sensor unit including a digital signal (Column 4, lines 20-45).

With regard to claim 9, Rialan discloses that the signal is an analog signal, the apparatus further comprising an analog-to-digital converter disposed in the acquisition device for converting the signal to digital data (Column 4, Lines 20-45).

With regard to claim 13, Rialan discloses that the memory unit includes an inductive coupling device for transferring the information stored in the memory unit to an external device (Column 5, Column 4, Lines 20-45).

With regard to claim 14, Rialan discloses that the memory unit includes an optical coupling device for transferring the information stored in the memory unit to an external device (Column 5, Lines 12-53).

With regard to claim 15, Rialan discloses that the sensor unit is coupled to the acquisition device using a sensor connector, the memory unit also being coupled to the sensor connector for enabling retrieval of the information stored in the memory unit using the sensor connector (Column 5).

With regard to claim 16, Rialan discloses that communication with the central controller provides wireless command and control for the apparatus (Columns 4-5) (Fig. 1).

With regard to claim 17, Rialan discloses a processor associated with the acquisition unit and the communication device, the processor processing programmed instructions enabling a software defined radio transceiver (Column 4, Lines 35-47; Column 5).

With regard to claim 18, Rialan discloses that the communication device includes a direct conversion radio transceiver for wireless communication between the apparatus and the remotely located central controller (Column 4, Lines 35-47).

With regard to claim 19, Rialan discloses a processor in the acquisition unit for providing one or more of local control, time keeping, or power management (Column 2; Columns 4-5).

With regard to claim 26, Rialan discloses a GPS receiver associated with the sensor unit for determining the location parameter (Column 4, Line 61 to Column 5, Line 5).

With regard to claim 61, Rialan discloses a system for seismic surveying. Rialan discloses a central controller 1, a sensor unit R remotely located from the central controller, the sensor unit coupled to the earth for sensing seismic energy in the earth and for providing a signal indicative of the sensed seismic energy (Fig. 1) (abstract; Column 4, Lines 10-45). Rialan discloses a recorder device B co-located with the sensor unit and coupled thereto for receiving the signal and for storing in digital form

information indicative of the received signal in a first memory disposed in the recorder device (Column 4; Column 5, Lines 30-53). Rialan discloses a second memory for storing a location parameter associated with the sensor unit (Column 4, Lines 47-60; Column 5, Lines 40-55), and a communication device co-located with the sensor unit and the recorded device for providing bi-directional communication with the central controller (Column 4, Lines 20-47; Column 5).

With regard to claim 62, Rialan discloses an energy source S for providing the seismic energy to the earth (Fig. 1).

With regard to claim 63, Rialan discloses that the communication device includes a two-way wireless transceiver for wireless communication with the central controller (Columns 4-5).

With regard to claim 69, Rialan discloses a system for seismic data acquisition. Rialan discloses a central controller 1, and a plurality of sensors R disposed to form a seismic spread having a plurality of sensing locations (Fig. 1) (abstract; Column 4, Lines 10-20). Rialan discloses a plurality of recorders B, each of the plurality of recorders recording seismic information corresponding to a selected sensing location from the plurality of sensing locations, each of the plurality of recorders being in direct bi-directional communication with the central controller (Columns 2-3; Column 4, Lines 25-47; Column 5).

With regard to claim 70, Rialan discloses an apparatus for seismic data acquisition (Fig. 1). Rialan discloses a plurality of sensors R disposed to form a seismic spread having a plurality of sensing locations (Column 4, Lines 10-20) (Fig. 1). Rialan

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discloses a plurality of recorders B, each of the plurality of recorders recording in digital form seismic information corresponding to a selected sensing location from the plurality of sensing locations (Column 4; Column 5, Lines 30-53).

With regard to claim 71, Rialan discloses an apparatus for seismic data acquisition (Fig. 1). Rialan discloses a sensor unit R for sensing seismic energy, the sensor unit providing a signal indicative of the sensed seismic energy (Column 4). Rialan discloses an acquisition device B co-located with the sensor unit and coupled thereto for receiving the signal (Column 4; Column 5, Lines 30-53). Rialan discloses a memory unit disposed in the acquisition device for storing information indicative of the received signal (Column 5, Lines 30-53). Rialan discloses a direct-conversion radio transceiver for providing communication between the acquisition device and a remotely located central controller (Column 4, Column 5, Lines 13-55) (Fig. 1).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanenhaus as applied to claims 1-13 above, and further in view of Rialan.

With regard to claim 14, Tanenhaus does not disclose that the memory unit includes an optical coupling device for transferring the information stored in the memory

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unit to an external device. Rialan discloses a seismic survey system wherein the data is transferred from a memory unit to an external device by means of optical coupling device (Column 5). It would have been obvious to modify Tanenhaus to include an optical coupling device as taught by Rialan in order to transfer the data directly from one device to another without the operator of the devices having to leave the measuring space or without the receiver needing to be taken to another place to retrieve the data from it.

With regard to claim 62, Tanenhaus does not disclose an energy source for providing the seismic energy to the earth. Rialan discloses a seismic energy source S (Fig. 1) on the surface of the earth to provide seismic energy. It would have been obvious to modify Tanenhaus to include a seismic source in order to generate the seismic waves that can be recorded by the seismic sensors inside of the sensing device to obtain a seismic survey of an area.

Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rialan as applied to claims 1-3 above, and further in view of Siems.

With regard to claim 4, Rialan does not disclose that the sensor unit includes a velocity sensor. Rialan discloses that the sensors are seismic sensors but does not disclose the specific type of sensor. Siems discloses a similar seismic system as that of Rialan with a central controller and a spread of seismic sensors that are connected to the central controller by acquisition devices (Fig. 1). Siems discloses that 3-component geophones for taking the seismic data. It would have been obvious to include

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geophones as the sensors in Rialan as taught by Siems since Siems discloses that these are known to be compatible sensors for taking seismic surveys in these types of surveys in order to take seismic data along three axes (Siems, Column 4).

With regard to claim 5, Siems discloses that the sensor includes an accelerometer (geophone) (Column 4).

With regard to claim 6, Siems discloses that the sensor unit includes a multi-component sensor (Column 4).

With regard to claim 7, Siems discloses that the sensor unit has a multi-component accelerometer having a digital output signal (abstract; Column 4).

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rialan as applied to claims 1-3 and 8-9 above, and further in view of Tanenhaus.

With regard to claims 10-12, Rialan does not disclose that the first memory is a nonvolatile memory or that the memory is removable. Rialan discloses a memory, but does not disclose the specifics of the memory. Tanenhaus discloses the use of a nonvolatile, removable memory card in a device that can be used for seismic acquisition (Column 6, Lines 55-65). Tanenhaus discloses the use of FLASH memory, which is known to be used in removable memory cards. It would have been obvious to modify Rialan to include the use of nonvolatile, removable memory cards as taught by Tanenhaus in order to have a small memory device capable of storing large amounts of data as FLASH memory is able to do.

**Conclusion**

The cited prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott A. Hughes whose telephone number is 571-272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



SAH



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